The CX2 Technologies' "Integrated Model" for a National Emergency Response System

A Homeland Security concept from **CX2** TECHNOLOGIES a trade name of **BIZCOM USA**

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What was the FCC's intention when the 220-222MHz band was introduced?

▶ The Federal Communications Commission originally issued the 220-222 MHz frequency band to allow the entrepreneur the opportunity to participate in the wireless industry and to allow for the development of new narrowband technologies to create an advanced method of spectrum efficiency.

▶ BizCom USA, Inc. d/b/a CX2 Technologies is the **only** company that has successfully developed both mobile and fixed data radios and base station products within the narrow 5 KHz spacing as the FCC intended when the 220-222MHz frequency band was issued.

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How can the 220 MHz band play a role in a national Homeland Security interoperable solution?

▶ The 220-222 MHz frequency is currently under utilized. This unencumbered spectrum has excellent potential application for properly targeted use by the Department of Homeland Security as part of a National Emergency Response plan.

▶ CX2 Technologies' spectrally efficient data technology that maximizes efficiency within the 5 kHz channels creates a potential usage profile not previously possible. Other enabling technology for the band requires minimally two, and typically three contiguous channels while the CX2 technologies operate within a single channel.

▶ Additionally, the low usage within this band coupled with a data protocol that **guarantees transmission slots** for endpoint units means interference issues typical in broadband applications can be avoided.

▶ A strong benefit to utilizing 220 MHz narrow band technologies is the spectrum relief that can be realized on other heavily used frequency bands. Data only applications using small message sizes would not compete for bandwidth with Law Enforcement, Fire and Rescue, and other responders with heavy requirements for 2 way voice, paging, or cellular networks. This would aid in reducing congestion on those networks while allowing clean data delivery within the 220-222 MHz space.

Is the 2 MHz of Bandwidth in 220 enough to support a nationwide data network?

▶ The efficiencies of CX2's technology coupled with the availability of the spectrum band makes it possible to seriously consider the 220 MHz frequency band for properly targeted applications.

▶ The creation of a **national sensor network** is an excellent example of an ideal application for narrowband technology.

▶ Messages of 50 bytes can be queried at a rate of 330 end points-per-minute/per channel. This would be the rate at which data points would be polled during a disaster.

▶ The system can service 4,950 endpoints per channel per location while polling each endpoint every 15 minutes. The majority of these endpoints would most likely be fixed (the sensors), but mobile endpoints could also be used with Automatic Vehicle Location (AVL) attached if desired.

How does the CX2 system work?

▶ CX2 can deploy a national sensor network over its nationwide or regional 220 MHz frequencies, in which sensor data is sent to Local Site Servers (LSS) located in hardened facilities.

▶ A single LSS can manage 24 tower sites covering approximately 30,000 square miles. The LSS sends the data to a gateway from which it can be distributed in any way necessary, thus meeting interoperability requirements.

▶ The network administrator can re-route sensor data to accommodate any response scenario. This function can be performed independent of voice and/or video functions provided over other spectrum. Public officials and agencies can coordinate the information received over this network with other services thus producing a coordinated emergency response effort.

What technical advantages do the CX2 220 systems offer vs those operating on 700 MHz or other higher frequency bands?

▶ Due to the propagation characteristics of radio spectrum at 220 MHz and CX2's patented over-the-air protocol, CX2's wireless data networks are constructed with far fewer sites than other two-way wireless data communications systems.

▶ CX2's most significant advantages over other spectrum technologies are the dramatically lower capital costs needed to deploy network infrastructure and the significantly lower operating costs of providing service.

▶ CX2's over-the-air protocol is a **point to multipoint** design resulting in the efficient servicing of thousands of endpoints.

▶ The CX2 protocol guarantees transmission slots for terminal units while maintaining **reserve capacity** for event driven or user initiated communication. Thus interference is virtually eliminated and transmission efficiency can reach a reliability level not routinely attainable when competing with other communications in a broadband space.

How much of the 220 MHz band is available for public safety use?

▶ BizcomUSA d/b/a CX2 Technologies has FCC licenses for approximately one fifth of the Nationwide and Regional Economic Area licenses in the 220-222 MHz band, including one 10 channel nationwide license (and approximately 10% of the Economic Area licenses).

▶ Ten of the channels in the 220 MHz band in Phase II were set aside specifically for public safety use. In addition, one of the 10-channel Phase II nationwide licenses was reserved for federal use.

▶ Nationwide 220 MHz channels also are currently held by National Rural Telecommunications Cooperative (WPCU518) and the Association of American Railroads (WPWY753).

▶ All of these frequencies --along with the approximately 1,170 220-222 MHz frequencies licensed by the FCC to CX2 --could be a key part of the FCC's national public safety strategy.

What is CX2's vision of their potential role in a national Homeland Security response strategy?

▶ CX2 Technologies has developed various software solutions that are both stand alone and capable of being integrated into their software driven data radios.

▶ CX2 has developed software applications designed for use in Emergency Operation Centers, in the incident response vehicles (i.e.: police, fire), and for medical response, tying in hospitals and ambulances.

▶ Existing customers are not routinely using the full integration potential of these products. However, software solutions are currently being used by State, City and County Emergency Management Facilities in Mississippi, Illinois, and Hawaii as well Los Alamos National Laboratory in New Mexico.

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What is GeoCommand?

▶ GeoCommand™ is an **in-vehicle** GIS based mobile mapping application. It is typically used by Law Enforcement and Fire and Rescue, but is equally helpful to all incident response personnel including Utilities and EMS.

▶ GeoCommand gives responders instant access to valuable incident specific data via overlaying GIS map layers and additional embedded information.

▶ GeoCommand helps responders:
   1. know where to go and how to get there (GIS mapping)
   2. improve spatial awareness (aerial photography)
   3. improve site intelligence (pre-plans, site photos, blueprints, floor plans, related documents)
   4. increase response effectiveness and execution confidence (embedded ER manuals)

▶ GeoCommand is not dependent upon wireless connectivity.
It can act as a stand-alone application, or, for better functionality, be integrated with CX2's FleetTracer™ Automatic Vehicle Location (AVL), and/or 3rd party Computer Aided Dispatch (CAD).

▶ The GeoCommand communication interface is one-way/receive-only at this point. The company can develop this interface to be two way. With this advancement, the responder would be able to access data from nuclear, biological, radiological and weather sensors via the command center. This would provide improved response capabilities, as well as improved safety for the on site responders.

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What is EM/2000?

► EM/2000 is a software application designed for emergency management. It is typically used as the incident management software at emergency management agencies.

► The EM/2000 program is comprised of 14 inter-related databases that allow the emergency management center to:
   1. ascertain the magnitude of an emergency or disaster
   2. track, locate and deploy resources
   3. log incident activities
   4. track requests and tasks
   5. generate situation reports and
   6. communicate critical information across local and
      wide-area networks and the internet (e-mail).

► EM/2000 is **designed for interoperability** among response agencies at local, county, state and federal levels.

► EM2000 is written in a Lotus Notes platform. The company has taken a cautious approach to the sale of this product because it has appeared that the Department of Homeland Security has been encouraging the use of Microsoft software. It is the company's belief that a Lotus Notes platform is less vulnerable than a Microsoft platform, and therefore offers a higher degree of scalable security.

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How can hospitals and ambulances become more interoperable with other response agencies?

▶ CX2 Technologies believes that integrating hospitals and ambulances with incident response is essential to an effective response protocol. It is part of the company's vision for an end to end solution.

▶ In January 2002, JCAHO (Joint Commission on Accreditation of Healthcare Organizations) introduced three new emergency management standards that are mandated to be adhered to by their health care organizations.

▶ CX2 Technologies software developers along with emergency managers collaborated to develop Med·Stat·Us. Med·Stat·Us is a user friendly software solution that supports the JCACO standards.

▶ It is written similarly to EM/2000. Like that program, it is designed as a set of inter-relational databases.

▶ Med·Stat·Us is also able to maintain records on multiple distribution sites for the CDC's National Pharmaceutical Stockpile, providing multi-tier deployment capabilities.

▶ This product is still in the design stage and on hold because of capital constraints.

▶ With some research and development, Med·Stat·US will allow:
  1. tracking bed count availability and capacity by specialty (OB/GYN, Orthopedics, ER, Pediatrics, etc)
  2. tracking of patients across facilities and/or large regions
  3. tracking of pharmaceutical shipments and dispensing
  4. consolidation of emergency plans

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To Summarize:

CX2 has demonstrated commitment to the advancement of narrowband technologies and the **dedication and vision** to apply a new technology concept in real world environments to achieve emergency communications capabilities and public safety communications interoperability. This data solution will not compete with consumer users. The spectrum is currently available and unencumbered. The cost efficiencies suggest that CX2's 220 MHz spectrally efficient technologies present a viable solution and merit serious consideration.

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